

UNCLASSIFIED

Security Classification This Page

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority: N/A			
3. Declassification/Downgrading Schedule: N/A			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: Joint Military Operations Department			
6. Office Symbol: 1		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification (U) <u>Operational Art Can Neutralize the Asymmetric Small Boat Threat in Major Operations</u>			
9. Personal Authors: Owen L. Sirrs			
10. Type of Report: FINAL		11. Date of Report: 1/31/02	
12. Page Count: 38			
13. Supplementary Notation: A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: Fast Attack Craft; Operational Art; Planning; Iran; North Korea; Asymmetric threats			
15. Abstract: As the United States naval services continue to emphasize operational maneuver from the sea and war in the littorals, potential adversaries are responding with innovative, often asymmetric approaches to coastal naval warfare. Two of these would-be opponents - Iran and North Korea - are exploiting small boat warfare and integrated coastal defenses to blunt, neutralize, or defeat U.S. Navy and Marine Corps operations in their littorals. Effective tactical level, shipborne defenses against small boats are still elusive; however, the application of operational art, particularly the use of operational fires and the proper synchronization and sequencing of operational functions and taskings, can reduce, even defeat, significant small boat threats and coastal defenses in major operations.			
16. Distribution / Availability of Abstract:	Unclassified	Same As Rpt	DTIC Users
17. Abstract Security Classification: Unclassified			
18. Name of Responsible Individual: Dean of Academics, Naval War College			
19. Telephone: 841-2245		20. Office Symbol: 1	

Security Classification of This Page: UNCLASSIFIED

Encl ()

NAVAL WAR COLLEGE

Newport, RI

Operational Art Can Neutralize the Asymmetric Small Boat Threat in Major Operations

By

Owen Sirrs

A paper submitted to the faculty of the Joint Military Operations in partial satisfaction of the requirements of the College of Naval Command and Staff.

The contents of this paper reflect my own personal views, and are not necessarily endorsed by the Naval War College or the Department of the Navy

Signature: _____

02 February 2002

Report Documentation Page		
Report Date 04 Feb 2002	Report Type N/A	Dates Covered (from... to) -
Title and Subtitle Operational Art Can Neutralize the Asymmetric Small Boat Threat in Major Operations	Contract Number	
	Grant Number	
	Program Element Number	
Author(s)	Project Number	
	Task Number	
	Work Unit Number	
Performing Organization Name(s) and Address(es) Joint Military Operations Department Naval War College 686 Cushing Road Newport, RI 02841-1207	Performing Organization Report Number	
Sponsoring/Monitoring Agency Name(s) and Address(es)	Sponsor/Monitor's Acronym(s)	
	Sponsor/Monitor's Report Number(s)	
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes The original document contains color images.		
Abstract As the United States naval services continue to emphasize operational maneuver from the sea and war in the littorals, potential adversaries are responding with innovative, often asymmetric approaches to coastal naval warfare. Two of these would-be opponents - Iran and North Korea - are exploiting small boat warfare and integrated coastal defenses to blunt, neutralize, or defeat U.S. Navy and Marine Corps operations in their littorals. Effective tactical level, shipborne defenses against small boats are still elusive; however, the application of operational art, particularly the use of operational fires and the proper synchronization and sequencing of operational functions and taskings, can reduce, even defeat, significant small boat threats and coastal defenses in major operations.		
Subject Terms		
Report Classification unclassified	Classification of this page unclassified	
Classification of Abstract unclassified	Limitation of Abstract UU	

Number of Pages

39

Introduction

On 12 October 2000, the USS Cole, a billion dollar warship equipped with the latest in American sensor and weapons technologies, was nearly sunk by a simple rubber raft laden with explosives and piloted by men intent on Islamic martyrdom. In the aftermath of this attack, which killed 17 and wounded 42, the U.S. Navy (USN) has reexamined its force protection posture as well as tactics, techniques, and procedures for defeating small boat attacks in congested waters. Additional attention has also been directed towards the asymmetric aspects of fast attack craft (FAC), such as their possible use with weapons of mass destruction (WMD).[1]

Unfortunately, much of the post-Cole small boat warfare literature has focused almost exclusively on the terrorist dimension; relatively little attention had been devoted to how some navies are planning to use FACs against potential USN operations in their home waters.[2] Indeed, as this paper reveals, at least two likely U.S. adversaries are exploiting the advantages of employing FACs in close coordination with coastal mines, cruise missiles, submarines, artillery, and related sensor and communications technologies. Chisholm refers to these interwoven layers of weapons and sensors as Integrated Coastal Defenses (ICD). Whatever term is used to describe it, the ICD is a reaction to the U.S. military's increased emphasis on littoral warfare.[3]

While effective ship defenses against small boats remain elusive at the tactical level (see Appendix B), this author contends that operational art offers the best means to neutralize, even destroy, FACs in major military operations. To substantiate this argument, the following paper is divided into two sections. Part I uses Iranian and North Korean FAC flotillas to illustrate the operational force, space, and time dimensions of the threat. Part II posits that recognizing the operational dimension of the FAC threat is not enough: planners must incorporate carefully synchronized and sequenced taskings into their plans if operational art is to successfully handle ICDs in general and the small boat problem in particular. To develop this point, Part II offers a notional

concept plan (CONPLAN) targeted against Iran's sea denial strategy and the ICD which supports it. The reader will note that defeating or neutralizing FAC swarming attacks is a vital aspect of this plan.

Finally, Part II also includes references to the 1945 invasion plan of southern Japan that was superseded by atomic bomb strikes on Hiroshima and Nagasaki. Significantly, this operations plan, known as OLYMPIC, contained specific taskings to destroy Japanese suicide boats and coastal defenses that are still relevant today. OLYMPIC also highlights the lesson that FAC warfare is a timeless "asymmetric" strategy for those smaller navies who are willing to confront opponents possessing overwhelming naval and maritime power.

PART I: The Small Boat Threat in Terms of Forces, Space, and Time

The operational dimensions of the small boat threat are best perceived through the focus of factors force, space, and time. As noted earlier, Iranian and North Korean flotillas are used to illustrate how two present day powers are using FACs as a significant element of their coastal defenses. Finally, the Persian Gulf and Yellow Sea littorals demonstrate how space and time factors can impact the effectiveness of asymmetric small boat warfare.

Factor Force. Small boats rarely comprise the primary striking arm of any navy. Nevertheless, in the case of Iran and North Korea they do represent a vital spoke of integrated coastal defense systems that also include anti-ship cruise missiles (ASCM), submarines, artillery, theater ballistic missiles (TBM) and mines.[4]

A vulnerability common to nearly all small surface combatants is their general lack of organic multidimensional force protection. Unlike their larger cousins, FACs simply cannot accommodate complex air defenses. From USN operations against Japanese suicide boats off Okinawa in World War II to the Persian Gulf tanker wars of the mid-1980s, aircraft remain the most lethal threat to the small boat flotilla.[5]

Iran. The Islamic Republic of Iran offers an excellent example of a developing country's efforts to construct an ICD. Begun in the late 1980's as a reaction to increased U.S. military operations in the Persian Gulf, Tehran's coastal defenses have been systematically enhanced over the years with improved mines, submarines, cruise missiles, and a growing flotilla. Indeed, while Iran's larger surface combatants have been allowed to stagnate, its FAC inventory continues to grow in both numbers and capabilities (See Appendix C).[6]

The Iranian Revolutionary Guards Corps Navy (IRGCN) is the sole custodian of Tehran's small boat asymmetric capabilities. As such, the IRGCN has augmented its traditional speed boat flotilla with domestically produced motor launches, Chinese-built patrol craft equipped with the C-802 ASCM, and fast attack missile catamarans capable of speeds in excess of 50 knots. Reflecting its emphasis on unorthodox methods of warfare, the IRGCN has also experimented with explosive-laden suicide boats, jet skis, and remote-controlled vehicles.[7]

In qualitative terms, neither the IRGCN nor the regular Iranian Navy comes close to their Western counterparts in terms of equipment or technically competent personnel. Indeed, some deficiencies are highly relevant. Cordesman points out for example that Tehran's lack of over the horizon targeting is a serious check on its otherwise impressive ASCM capabilities.[8] Furthermore, education levels and technical skills among IRGCN volunteers probably are generally low. Still, the flotilla accommodates these education and training shortfalls since motor boats are relatively easy to operate and require minimal levels of training and maintenance. In that vein, the speed boat is truly the poor man's warship. As a military platform, it can be effective if used in coordinated attacks on lightly defended or unwary targets; however, as Phelan warns, significant training is required to maneuver these high speed assets in close formations at night.[9]

The Democratic Peoples Republic of Korea (DPRK). With a military geared toward land battles and a fleet divided by two coastlines, North Korea's coastal defenses are not on a par with

those of Iran (See Appendix D). Indeed, much of the equipment of the Korean Peoples Navy (KPN) is 1960s vintage, including the venerable SS-N-2/STYX ASCM and its associated OSA and KOMAR fast attack platforms. This point aside, the DPRK has made progress in developing specialized, high speed, semi-submersible infiltration boats and air cushion vehicles that can navigate the tidal pools, numerous islands, and sand bars of the Yellow Sea littoral. Furthermore, KPN FACs likely enjoy the benefit of hardened shelters which can shield them from detection and destruction by opposing forces.[10]

The KPN flotilla not only has an anti-surface warfare mission, it also performs a significant special forces role as well. Given these missions, the operational threat to U.S. forces is palpable: KPN FACs can be used against warships, merchant shipping, naval bases, and poorly defended coastal facilities. Furthermore, they can insert special forces teams behind Republic of Korea (ROK) lines to sabotage or destroy high value command and control and logistics targets. The operational level impact of these activities is easy to recognize.[11]

The quality of KPN personnel may be suspect given the wretched state of the economy and the near-famine conditions that wrecked the countryside in the late 1990s. Bermudez believes that morale is higher in the special forces, which are responsible for the infiltration and sabotage missions. Pyongyang's ability to intimidate the families of its special forces no doubt reinforces their commitment to suicide missions. In general, however, KPN personnel lack the technical competence of their USN counterparts.[12]

Factor Space. The effective use of the space factor is fundamental to small boat operations. If used properly in conjunction with space-limiting weapons such as mines, geographical features (islands, reefs, etc.) can shield FACs from detection and attack. Moreover, as Hughes points out, man-made clutter including shipping and electronic emissions also enhance the ability of FACs to move undetected through the littoral.[13] For blue water fleets, the narrow seas can hamper

operational maneuver. Finally, the advent of the ASCM has revolutionized FAC operations: small boats can now hit targets at considerable distances, thereby compressing the dual problems of space and time.

The Iranian Littoral. The Persian Gulf can be a challenging environment for a blue water fleet intent on dominating its littorals. Operational maneuver is hampered by the narrow width (210 miles at its widest point) and shallow waters of the Gulf. Prospective operating areas are cluttered by natural and man-made obstacles, including islands, reefs, sandbars, merchant ships, and oil rigs. A seemingly ubiquitous haze can limit visibility to less than one mile. Access to the Gulf is controlled by the Straits of Hormuz; unfortunately for the U.S. and its allies, Iran exercises a controlling position over this vital waterway (See Appendix E for map).[14]

Iran dominates the Gulf through a 2,000 mile long coastline that extends from the Shatt al Arab in the north through the Straits of Hormuz to the Indian Ocean. This extensive littoral at once presents both a blessing and a curse for Iranian military planners. While the long shoreline provides Tehran with an unparalleled ability to project naval power throughout the Gulf, its very size also stresses the country's already overburdened navies. Additionally, the Iranian littoral opens up numerous avenues of approach to the Persian heartland for would be invaders from the sea. Indeed, the sheer size of its coastline forces Tehran to divide its fleet among several ports, including Bushehr in the north and Bandar-e Abbas in the south.

For FAC operations, Iran's littoral offers a few tangible benefits as well as some daunting challenges. A belt of offshore islands in the southern Gulf and along the Straits of Hormuz offers excellent staging areas for mustering FAC swarms; these islands can also veil small boat operations from airborne reconnaissance and ship borne radar. Furthermore, the narrow shipping channels which traverse the Straits present a superb battlespace in which FACs can inflict significant damage

on an unwary enemy. Finally, the limited space of the Gulf can contribute to tactical, possibly operational surprise, as Vego explains:

The small size of a typical narrow sea offers even the weaker opponent at sea the opportunity to carry out surprise attacks against enemy targets with a high probability of success.[15]

Conversely, Iran's long shoreline hampers the effectiveness of small boat warfare. Since many IRGCN FACs are based at Bushehr, and given their limited tactical range, Iranian military planners must consider how these assets are deployed in wartime. For example, how and when should FACs be deployed to the anticipated area of operations such as the Straits of Hormuz? Should ground, sea, or air transport be used after hostilities have commenced with the attendant risks of aerial interdiction? Or should the flotilla attempt to traverse this distance under its own power? These are important space considerations that will impact on how Iranian small boats perform in combat and in what numbers.[16]

The North Korean Yellow Sea Littoral. Political geography has imposed a particularly harsh penalty on the DPRK Navy, for it has been tasked with the defense of separate coastlines that never meet within national boundaries. In fact, the Republic of Korea (ROK) occupies the dominant position by virtue of the fact that it controls the tip of the Korean peninsula. Given these realities, the KPN must divide its assets between fleets that will not be mutually supportive in wartime (See Appendix F for map).[17]

While divided fleets hinder the KPN's ability to mass strength on a given target, unique geographical features of the Yellow Sea littoral do benefit FAC operations and coastal defenses. Indeed, much of the DPRK's west coast offers excellent opportunities for small boat warfare, since it is characterized by shallow, murky waters, numerous mud flats and shoals, sharp tidal variations, and more than 3,000 islands. KPN fast infiltration craft and air cushion vehicles are not restricted by

the same draft restrictions of larger vessels and can transit these waters with relative ease.

Furthermore, islands and inlets provide cover and basing for FAC operations.[18]

The benefits of operating in the Yellow Sea littoral aside, DPRK FACs face the same operational maneuverability problems as their Iranian counterparts. To solve the challenge of maneuvering its infiltration craft into ROK waters, the KPN has pursued both at-sea refueling and “mother ship” small combatant tenders, although these latter vessels tend to negate some of the low observability advantages inherent to FACS. [19]

Factor Time. At the theater-strategic level of warfare, the integrated coastal defense concept is an essential component of a delaying strategy. Coordinated small boat, coastal defense cruise missile (CDCM), and mine operations are geared not only towards deterrence (although that is very important too), they are also intended to prevent or at least delay the ingress of hostile naval forces into a littoral region. The time gained by holding the enemy at the gates can be spent in a number of ways, including the establishment of regional alliances, diplomatic initiatives at the United Nations, or even the weakening of an adversary’s resolve through prolonged hostilities. At the end of World War II, Japan banked on its extensive coastal defenses and suicide boats to inflict heavy casualties on the United States and delay an assault on the home islands. Tokyo’s objective was simple: avoid unconditional surrender by weakening Washington’s will to fight. [20]

At the operational level, coastal defenses buy critical time for the mobilization of reserves and the deployment of additional assets to the operating area. Using a hypothetical North Korean invasion of the South as an example, should that attack fail, Pyongyang would likely fall back on its ICD to forestall US-ROK Inchon-type operations in its rear. The DPRK would also use these defenses to gain time for the mobilization and deployment of military resources and the possible introduction of Chinese forces into the war.

As we approach the tactical spectrum, the role of FACs in coastal defense becomes more readily apparent. At this level, timing is crucial for the execution of small boat surprise attacks against a superior opponent. Take the Straits of Hormuz, for example. Since space in the 5-8 mile wide shipping channels is restricted for large warships, reaction times to warning indicators are significantly compressed relative to the blue water environment. With their high speed, maneuverability, and, in many cases, standoff weapons, FACs can rapidly close the distance to surface targets. Indeed, the defending force may encounter serious problems acquiring, accurately identifying, and destroying a small boat swarm in the short response time available. The identification problem and limited reaction times become particularly acute if unmarked suicide boats are used: distinguishing friend and neutral from foe is exceptionally difficult in these conditions as USN experiences in the Gulf can attest.[21]

PART II - Operational Art Can Neutralize the FAC Threat

Recognizing the nature and scope of the small boat threat is not enough. In devising plans for countries possessing flotillas and integrated coastal defenses, staffs should incorporate counter- and anti-FAC missions into their taskings. Yet as they tackle the FAC and ICD problems, operational planning staffs would be wise to consult the 1945 OLYMPIC plan to invade southern Japan. Indeed, OLYMPIC planners grappled with an array of threats similar to those anticipated in the Straits of Hormuz: suicide boat swarms, *Kamikaze* aircraft, midget submarines, extensive mine belts, and coordinated coastal artillery networks.[22]

A notional plan is a useful method with which to illustrate how operational art can defeat or at least neutralize coastal defenses and the flotilla. Under the following scenario, Iran has blocked the Straits of Hormuz with mines and plans on using its coastal defenses to delay and inflict significant casualties on two U.S. carrier battle groups (CVBG). Following a brief outline of the scenario, the discussion focuses on the operational aspects of the plan, including scheme, functions,

and sequencing. In keeping with the theme of this paper, specific counter- and anti-small boat taskings are highlighted.[23]

SCENARIO: On 2 May 2003, long simmering tensions between Iranian reformers and conservatives exploded as students clashed with security forces in Tehran, Tabriz, and Isfahan. In response to these “provocations,” hard-liners close to Supreme Leader Ayatollah Khamenei ordered a state of emergency. When this did not quell unrest, the IRGC was secretly instructed to provoke a crisis with the U.S. in a bid to divert attention from Iran’s internal problems.

To that end, suicide boats manned by IRGC volunteers executed missions against the USS Rentz (FFG-46) and USS Higgins (DDG-76) which were conducting Maritime Interception Operations in the northern Gulf. Although most attacks were thwarted, one FAC collided with the Rentz, causing extensive damage. Meanwhile, another suicide FAC operated by IRGC- trained Lebanese terrorists sank a container ship at the northern entrance of the Suez Canal.

Evading any claims of responsibility, Iranian leaders whipped up a wave of hysteria at home. America’s war on terrorism, they warned, was about to engulf the Islamic Republic. In response to this “war on Islam” Tehran announced that the Straits of Hormuz would henceforth be closed to American warships.

Meanwhile, U.S. Central Command (CENTCOM) staffers have dusted off a CONPLAN which pivots around the operational objective of destroying Iranian forces in the Straits. Entitled STEEL RAIN, the original plan rested on two assumptions: (1) access to Gulf Arab airbases; (2) access to the Suez Canal. Revisions had to work around the temporary loss of the Canal; STEEL RAIN also incorporated the latest intelligence on the strength, capabilities, and dispositions of Iran’s flotilla and coastal defenses. An abridged outline of the plan follows.

Operational Scheme. CONPLAN STEEL RAIN identifies air defenses, and command, control, and communications (C3) nodes as critical Iranian vulnerabilities. Consequently, the plan hinges on exploiting these vulnerabilities to destroy, or at least significantly degrade, Iran’s operational center of gravity: the integrated coastal defenses. A careful reading of the plan highlights the key role of U.S. air power in eroding the ICD, opening the Straits for the transit of the CVBGs, and supporting subsequent landings on several Iranian islands.[24]

Operational Functions. Although the employment of combat forces at the operational level of war typically rests on several operational functions, this paper focuses on those most directly linked with defeating FACs: operational intelligence, fires, and protection.

Operational Intelligence. Vego observes that intelligence “is one of the most critical functions supporting planning, preparations, and execution of a major operation or campaign.”[25]

Indeed, STEEL RAIN relies on the prompt and accurate identification of high priority targets such as ballistic missiles, CDCMs, WMD sites, air defense and C3 facilities, and FAC bases.

While the CONPLAN is built on intelligence gathered prior to hostilities, wartime exigencies demand several national and theater collection assets such as RC-135 and EP-3. If available, J-STARS would provide critical near-time intelligence on mobile targets such as TBM launchers and FACs. The Joint Force Maritime Component Commander (JFMCC) based at US Fifth Fleet Headquarters in Bahrain is particularly concerned with the location of Iran's three KILO submarines; imagery and measurements and signatures intelligence (MASINT) may offer some answers to this requirement.[26]

If the U.S. planners are blessed with exceptional fortune, they will have intelligence comparable to that available to OLYMPIC planners in 1945. According to MacEachin, ULTRA intelligence derived from signals intercepts not only alerted OLYMPIC staffs to significant increases in Japan's order of battle on the southern island of Kyushu, it also indicated the growing presence of *Kamikaze* aircraft, human torpedoes, and small surface craft. Skates concurs,

[U]LTRA revealed a growing threat from Japanese suicide boats, midget subs, and Kaiten (manned torpedoes). "The Japanese are planning in great detail for the preparation of surface suicide attack bases," warned an ULTRA summary... Japanese naval commanders were selecting personnel to carry out "waves edge surprise attacks...Bases were under construction on Shikoku and the east coast of Kyushu...ULTRA also revealed plans to send the remaining surface fleet on suicide missions once the invasion began.[27]

A shrewd critic will charge that operational intelligence, surveillance, and reconnaissance (ISR) represent a potential achilles heel of the CONPLAN. While there is no denying the decisive role of ISR in locating FACs or TBM transporter-erector-launchers (TELs), sensor technology is rapidly nearing a point where U.S. forces will possess what one Pentagon official calls "persistent ISR." Indeed, it is this "persistent ISR," amply demonstrated over the skies of Afghanistan, that will ensure near-continuous coverage of the STEEL RAIN battlespace.[28]

Operational Fires. Using kinetic and non-kinetic weapons, STEEL RAIN employs operational fires on C3 sites, TBM production and handling facilities, WMD plants, transportation nodes linking the area of operations to the interior, as well as FAC bases. The goal of operational fires is to isolate the Straits of Hormuz battlespace and inhibit Iranian attempts at operational maneuver. In addition, operational fires may delay or prevent the deployment of Bushehr-based FACs to the operations area by ship, air transport, or truck. Thus, operational fires both precede and run parallel with the phases aimed at clearing the Straits.[29]

Operational Protection. The sheer numbers and growing capabilities of Iranian FACs, combined with the possibility that they might be employed in a suicide role, elevate the importance of small boat warfare in the STEEL RAIN operational protection plan. The planning staffs are particularly concerned with force protection and the need to shield the CVBGs (the U.S. operational center of gravity) from small boat attacks inside the Straits of Hormuz.

Borrowing some key concepts from OLYMPIC, the CENTCOM planners incorporate the concepts of defensive pickets and “Fly Catcher” patrols to provide early warning for and defense of the CVBGs from small surface threats. Although these tasks might also fall under tactics, techniques, and procedures, they do have a bearing on the operational commander’s decisions, since they touch on operational level force protection and the employment of scarce assets. Under the CONPLAN, the planners envision small hunter-killer groups, consisting of destroyers or frigates acting as control platforms for helicopter and small surface combatant “catcher” groups. Depending on availability and deployments, these “catcher” units could include Marine Corps AH-1 Cobras, AC-130s, Mark V Special Operations craft, Cyclone Class Patrol Craft or Marine Amphibious Assault Vehicles (AAV). It should be noted that the AA(A)Vs are also tasked to support the Phase 4 landings; however, these may be relegated to catcher duties later.[30]

The planners borrow another idea from OLYMPIC: depending on time, fuel, and ordnance, Combat Air Patrol assets are assigned the secondary task of reconnoitering specific sectors for FACS and destroying identified FAC bases in the operations area.

Finally, the possible employment of high speed surface (and air) platforms laden with chemical weapons (CW) is an additional force protection concern. Given Iran's proven CW capabilities, the possibility that such weapons might be utilized in unorthodox delivery systems such as small boats cannot be discounted.[31]

Phasing and Sequencing. The CONPLAN consists of five phases: (1) deployment; (2) air superiority; (3) battlefield preparation; (4) seize islands in the Straits; (5) redeployment. The condensed version of the plan contained herein excludes a significant amount of detail on phases one and five. Suffice it to say that the temporary dislocation of the Suez Canal coupled with persistent (but ultimately false) rumors of an unidentified submarine in the Red Sea necessitated numerous changes to the deployment phase. Valuable time was lost and transit schedules were disrupted with the consequence that Iran was able to deploy the bulk of its coastal defense assets to the Straits of Hormuz before all U.S. assets arrived in theater.

Given the integrated nature of Iran's coastal defenses coupled with its air defenses and proven WMD capabilities, proper sequencing is essential to the success of the operation. Indeed, the planners assess that synchronized and sequenced taskings will keep casualties to a minimum.

Phase 2 - Air Superiority in the Area of Operations (AO): Gaining air superiority over the battlespace enables all of the sequenced actions that follow. Consequently, the Suppression/Destruction of Enemy Air Defenses (especially the high altitude, long-range SA-5/GAMMON) combined with offensive counter-air missions against the Iranian Air Force are crucial to attaining this goal. From a small boat perspective, the elimination of friendly air power opens up a key tactical and operational vulnerability in FAC operations: poor protection against fixed wing and

rotary assets. Furthermore, degrading or destroying air defenses allows airborne intelligence platforms greater access to hostile airspace and presumably improved warning of FAC swarm attacks. It should be noted that air superiority was a major factor contributing to the defeat of Japanese suicide boats in the late stages of World War II.[32]

Phase 3 - Battlespace Preparation: Before the CVBGs can safely enter the Straits, Iranian defenses in the operations area must be attrited, destroyed, or neutralized. Consequently, this phase consists of a number of sequenced taskings, including command and control warfare (C2W) and actions against WMD facilities and the ICD.

Once a major portion of the air defenses are suppressed, non-kinetic weapons, aircraft, and Tomahawk Land Attack Missiles (TLAM) fired from submarines and surface ships in the Gulf of Oman are directed against C3 targets in the operating area. For Iranian small boats, the rapid degradation of C3 opens up yet another vulnerability since much of the coordination necessary to synchronize small boat swarms rests on operational and tactical C3.[33]

It should be noted that C3 problems also plagued Japanese suicide boat operations in 1944-45. Indeed, Chisholm believes that if the Allies had executed OLYMPIC, poor C3 would have posed operational and tactical coordination problems for Japanese small boat actions.[34]

While the C3 infrastructure is systematically attrited, other air platforms and TLAMs rely on time-sensitive intelligence to destroy ballistic missile TELS and Weapons of Mass Destruction (WMD) facilities in or near the operating area. Attacking Iranian WMD capabilities reduces a significant threat to US forces both at sea and during the landings.[35]

Following the degradation of Iranian C3 and WMD assets, aircraft and TLAMs are employed against the Bandar-e Abbas and Chah Bahar naval facilities and any pier-side surface assets, including FACs. As noted earlier, the JFMCC is concerned with the status of Iran's submarines. If

these can be destroyed in their pens, so much the better. Otherwise, submarines will pose a serious force protection dilemma as the operation proceeds.

Aircraft and TLAMs are also employed against Iran's coastal defense cruise missile (CDCM) sites, concentrating on the long-range C-802 and the SS-N-22/SUNBURN first followed by strikes on the shorter-range CDCM batteries and coastal artillery. Removing the CDCM threat eliminates another ICD layer, and opens up the FACs to surface ship attack. Nonetheless, the anti-CDCM task is complicated by the mobility of many of these systems. Accurate, "persistent" intelligence coupled with a compressed decision-making cycle - key features of network centric warfare - offer the best method of handling the thorny mobile launcher problem.[36]

Having neutralized or destroyed several facets of Iran's ICD, the JFMCC still faces the challenge of small attack boats and mines. For the moment, the location of the CVBGs in the Gulf of Oman renders them relatively impervious to the FAC threat given the latter's limited tactical range. Still, CENTCOM planners recognize that the FAC problem must be addressed before mine countermeasures (MCM) ships can be safely employed. As the operation enters the anti-FAC sequencing, Fly-Catcher patrols are moved forward to lure out small boats while aircraft are targeted against known FAC deployment areas and bases. Targeting the FAC infrastructure is particularly important. As Phelan observes in his history of small boat operations, "the only sure way to eliminate the menace from FACs is to destroy or occupy their bases." [37]

Again, it must be reiterated that the task of defeating the flotilla rests on accurate, time-sensitive intelligence. One benefit to US planners is that swarming operations stand a greater risk of detection than single boat activities. On the other hand, STEEL RAIN planners are challenged by the fact that Iranian FACs will probably be dispersed in well-camouflaged and possibly hardened bunkers and cave complexes. As the following excerpt highlights, OLYMPIC planners were confronted with very similar problems of FAC concealment:

Experience in recent operations indicates the probability of encountering large numbers of “suicide” boats and midget submarines. These craft are generally well hidden in camouflaged caves at the foot of cliffs and in river and canal banks... Careful, continuous observation...must be maintained of all likely sites as these craft must be destroyed before being given a chance to damage our ships.[38]

Only when the FAC threat has been reduced can the MCM vessels tackle the minefields. At this juncture in the operation, the ICD has been seriously weakened, although the JFMCC should assume continuing threats from surviving CDCM TELs and small boats.

Phase 4 - Seize Islands in the Straits. Although the original STEEL RAIN planning document did not include an amphibious landing phase, the National Command Authority instructs CENTCOM to plan and execute landings on several Iranian islands located on or near the Straits of Hormuz. The theater-strategic objectives of this new STEEL RAIN phase are two-fold: (1) ensure safe passage for US warships after the Straits are cleared; (2) use the islands as bargaining chips for the diplomatic talks to follow.

The landing phase includes several taskings aimed at further softening up the island defenses, and beach reconnaissance. Clearly, the force protection threat from residual FACs will be a significant concern to the fire support group and the amphibious forces as they approach and anchor at the landing sites. Operational protection measures, including pickets, Fly Catcher patrols, and aviation should reduce the FAC danger, although commanders must be prepared for small boat attacks, especially at night and possibly including the use of chemical weapons.

Ultimately, carefully sequenced operations offer the best method of dealing with integrated coastal defenses in general and the small boat threat in particular. As the STEEL RAIN plan demonstrates, operational art not only tackles the challenging ICD problem, it can probably accomplish this mission with fewer casualties by exploiting the weaknesses of air defenses and accentuating the advantages of US air superiority and standoff weapons.

Conclusion: Is a Ship a Fool to Fight a Fort?

In 1885, Admiral Theophile Aube, founding father of the French *Jeune Ecole* of naval strategy, confidently predicted that torpedo boats represented the future of naval warfare. Reinforcing his argument, Aube described how these small combatants would interact with coastal defenses to render the battleships of his day obsolete. For Admiral Aube and the *Jeune Ecole*, there was no doubt that the critical weapons of future naval combat must include,

...the greatest possible number of torpedo boats working in close coordination with coastal artillery and corvettes, all of which should have the maximum speed and smallest profiles to ensure autonomous operations and effective firepower; this combination of numbers, speed, and invisibility are the superior features of these weapons of war.[39]

While history did not validate the prophecies of the *Jeune Ecole*, the idea of small boat warfare did carry on, driven by the idea that, under certain conditions, the flotilla could damage, even destroy, the expensive warships of technologically superior adversaries. As Part I of this paper demonstrates, at least two potential opponents of the United States are exploiting FACs for their asymmetric advantages of speed, maneuverability, and stealth. Moreover, these countries have transformed their flotillas in ways that could never have been foreseen by the *Jeune Ecole*. Cruise missiles, sensors, and low observability have been added to surprisingly small platforms; other FACS include air cushions or second hulls for greater stability and speed. Still, the *idea* of small boat warfare remains essentially the same today as it did in 1885.

Changes in coastal defenses have been equally significant. Indeed, the modern ICD challenges a blue water adversary with a host of sophisticated weapons, including supersonic cruise missiles, mines with discriminating sensors, TBMs with chemical warheads, quiet diesel submarines, and a large flotilla of cheap, easy-to-build motor boats and patrol craft.

Given these advances in small boat warfare and coastal defenses, many question whether the United States naval services are even capable of carrying out operations in the littorals.[40] Yet, as Part II of this paper reveals, operational art can degrade or even overcome the ICD at the operational

level of war. Keeping the lessons of OLYMPIC and STEEL RAIN in mind, the ghosts of the *Jeune Ecole* and Japanese suicide boats need not intimidate an operational commander who is backed by a sound plan, superior technology, and a well-trained joint force.

APPENDIX A -- ABBREVIATIONS AND ACRONYMS

AAV	Amphibious Assault Vehicle
AAAV	Advanced Amphibious Assault Vehicle
AO	Area of Operations
ASCM	Anti-Ship Cruise Missile
C2I	Command, Control, and Intelligence
C2W	Command and Control Warfare
C3	Command, Control, and Communications
CIWS	Close-In Weapons System
CDCM	Coastal Defense Cruise Missile
CENTCOM	United States Central Command (based in Tampa, FL)
CONPLAN	Concept Plan
CW	Chemical Warfare
CVBG	Aircraft Carrier Battle Group
DIA	Defense Intelligence Agency
DPRK	Democratic People's Republic of Korea (North Korea)
FAC	Fast Attack Craft
FBE	Fleet Battle Experiment
FIAC	Fast Inshore Attack Craft (British Usage)
ICD	Integrated Coastal Defenses
IRGC	Iranian Revolutionary Guards Corps
IRGCN	Iranian Revolutionary Guards Corps Navy
ISR	Intelligence, Surveillance, and Reconnaissance

JFMCC	Joint Forces Maritime Component Commander
J-STARS	Joint Surveillance Target Attack Radar System (E-8 - based on B707 airframe)
KPN	Korean People's Navy (North Korea)
MCM	Mine Countermeasures
MIO	Maritime Interception Operation
ONI	Office of Naval Intelligence
OPLAN	Operation Plan
RAM	Rolling Airframe Missile
ROK	Republic of Korea (South Korea)
SAM	Surface-to-Air Missile
TBM	Theater Ballistic Missile
TEL	Transporter-Erector-Launcher (for ballistic missiles, cruise missiles)
TLAM	Tomahawk Land-Attack Missile
USN	United States Navy
USW	Undersea Warfare
WMD	Weapons of Mass Destruction (Chemical, Biological, or Nuclear weapons)

B -- TACTICAL LEVEL SHIP BORNE DEFENSES AGAINST FAST ATTACK CRAFT

At the tactical level, the FAC problem becomes one of rapid detection, identification, decision, and execution before the small boat can fire its ASCMs or collide with the intended target. In a narrow sea, the larger ship is hampered by lack of tactical maneuver room. Its sensors, designed for a blue water environment, can be stressed by terrain clutter, civilian electronic emissions, and numerous other surface craft. More importantly, reaction times are compressed to absolute minimums in particularly narrow waterways such as the Straits of Hormuz. As the USS Vincennes CO learned, there often is little time to determine whether an unidentified object (in the air or on the sea) is belligerent and can be destroyed. This problem is compounded by deliberate denial and deception measures perfected by the Iranians who sometimes disguise their small speedboats as pleasure craft or smugglers.

The terrorist attack on USS Cole has reinvigorated the debate on whether existing tactical defenses are sufficient to protect individual surface platforms in littoral environments. The ever delicate issue of rules of engagement has also been held up for criticism. Ultimately, the question boils down to whether individual surface combatants can survive single or multiple small boat attacks. Judging by the programs listed below, the jury still seems to be out on that question.

CURRENT DEFENSES: Modern USN surface combatants rely on one or more organic point defenses to destroy incoming small boat threats:

(1) Phalanx 1A Close In Weapons System (CIWS), which was designed to shoot down incoming ASCMs. This system may be effective against some small surface threats but only at extended ranges. CIWS mounts have been shaded a camouflaged gray on recent AEGIS-DDG-57 flights presumably to protect them from small arms fire. One can speculate on scenarios involving FACs dedicated to bringing down the defenses of the target and opening it up to attack by others.

(2) Rolling Airframe Missile - also designed to counter ASCMs, RAM works in coordination with CIWS. RAM currently is installed on several larger platforms, including Tarawa LHAs, Wasp LHDs, Whidbey Island LSDs, Harpers Ferry LSDs, San Antonio LPDs, Spruance-Class Destroyers, and Nimitz-Class CVNs.

(3) Mk 38 25 MM Machine Gun System. Self-explanatory. Found on a variety of surface ship classes.

(4) Mk 75 76 MM Gun Mount. Found only on Perry-class FFGs.

(5) Mk 45 5-Inch Gun Mount. Primarily for gun fire support, this weapon would be lucky to sink a rapidly maneuvering small boat.

(6) The sailor (or SEAL) equipped with the M-16 or handgun. Truly the last line of defense. The real questions are: how good is the sailor with small arms? Has his or her training been adequate? Can fast, maneuvering surface targets be hit with accuracy? Most importantly, how

good is the watch? How can mistakes be avoided? The State Department does not want to clean up after an itchy-fingered sailor fired on a port worker by mistake.

(7) Collective Protection System: installed on DDG-51, LHD, LSD-49, and AOE-6 replenishment ships, the CPS provides protection against chemical and biological weapons attacks. Essentially, this system provides zonal protective air enclosures. Since the Iranian, North Korean, and other potential U.S. adversaries possess stockpiles of BW and CW, these protective measures are critical.

(8) Backscatter: During congressional testimony, the Joint Staff Deputy Director for Operations listed an X-ray system used at Fifth Fleet Headquarters on Bahrain that reportedly can be employed against small craft and combat swimmers. Other details appear to be in the classified domain.

(9) Train, train, train. Numerous USN units are training for port security. Rigid Inflatable Boats are often employed to simulate Red Force FACs. Terrorism is the popular scenario. Ships also train at sea against incoming simulated FACs in self-defense drills

FUTURE DEFENSES. The following is a brief list of programs currently under development to handle the tactical aspects of small boat defense. The list is by no means exhaustive.

(1) Phalanx 1B. This updated CIWS has an improved capability to handle surface targets through software and sensor upgrades. Reportedly optimized for very small FACs such as jet skis. As with any program, the devil is in the costs. During June 2001 congressional testimony, RADM McCabe, Director, Air Warfare reported that the USN had 359 CIWS systems installed on ships. Although the CIWS 1B is a capable system, the USN simply lacks the resources to replace all mounts on a one-for-one basis. In fact, the navy faces problems overhauling the older mounts. Significantly, the Government Accounting Office reported serious funding shortfalls in the Navy's Phalanx program.

(2) SEA RAM. Employing RIM-116B missiles this system replaces the 20 mm gun barrel on CIWS. Reportedly offers a significant increase in capability to handle ASCMs and small surface craft. During testimony on Capitol Hill, RADM Kelly, Deputy Director, Surface Warfare, reported that RAM had achieved a success rate of 160 hits out of 165 targets engaged. Again, cost is going to be an issue with this system.

(4) Microwave projector. Described in congressional testimony as a "skin warmer" this experimental system would essentially employ microwaves against approaching unidentified surface craft that have entered the combatant's "danger zone." As one official told Congress, "Now if you're a tourist in your Boston Whaler and you're approaching one of our ships and you start to get warm, first you see green then you see yellow. When you see red, you're getting warm. You're probably going to turn around..."

(5) "Venetian Blind" Built out of a substance called LASCOR, this thin, lightweight material would be used as an "extra skin" on surface vessels as they transit dangerous narrow seas or

canals or prior to coastal combat. During congressional testimony, this substance was described as being able to repel attacks by shoulder-fired weapons (IRGCN regulars with RPG-7s?). Cole-type explosions would cause some “gross deformation” but would not penetrate the ship’s skin. Method of transport is quite simple - this substance can be rolled up and stowed on the ship’s deck.

SOURCES: Richard Scott, “UK Examines Counters to the FIAC Threat,” *Jane’s Navy International*, (October 2001), 4; Marc Boyd, “Mine Warfare Command tests Force Protection Readiness,” *Surface Warfare*, (September/October 2001), 24-27; Dick Cole, “USS Cole: Where do We Go From Here?” *Surface Warfare*, (January/February 2001), 6-12; Department of the Navy, *Commissioning of the USS Donald Cook (DDG 75)*, 4 December 1998; “U.S. Senator Edward Kennedy (D-MA) Holds Hearing on Seapower Operational Programs and Requirements,” 7 June 2001, Congressional Universe, Lexis-Nexis, (Dayton, OH: Lexis-Nexis), 19-20, 21-22; “Hearing of the Special Oversight Panel on Terrorism of the House Armed Services Committee,” 14 June 2001, Congressional Universe, Lexis-Nexis, (Dayton, OH: Lexis-Nexis), 18-19; “U.S. Senator Pat Roberts (R-KS) Holds Hearing on Defense Department Science and Technology Programs,” 5 June 2001, Congressional Universe, Lexis-Nexis, (Dayton, OH: Lexis-Nexis).

APPENDIX C -- IRANIAN ORDER OF BATTLE

Ground

Personnel:	345,000
Tanks:	1,680 (T-54/55, T-62, T-72, M-48, Chieftain, etc.)
Artillery	2,140 (includes towed, SP, MRL)
Armored Personnel Carriers	525

Air Defense

Personnel:	12,000
Surface-to-Air Missiles	400
SA-2/GUIDELINE	?
SA-5/GAMMON	?
I-HAWK	120
SA-6/GAINFUL	?
MANPADS	800
SA-7/GRAIL	
"Vanguard"	?
Anti-aircraft artillery	1,200

Strategic Forces

FROG 7 Battlefield Rocket System	250
Oghab Battlefield Rocket System	200
Nazeat Battlefield Rocket System	500
SS-1C SCUD B Ballistic Missile	200
SS-1D SCUD C Ballistic Missile	150
Shahab-3 Ballistic Missile	?

Strategic forces are critical strengths

Air defenses constitute a critical vulnerability in the Iranian military.

Air Force

Personnel:	30,000
Mirage F1	12
F-14A	30
F-4D/E	50
MiG-23/FLOGGER	24
MiG-27/FLOGGER D	24
MiG-29/FULCRUM	66
F-5E/F	73
Su-22/FITTER	35
Su-24/FENCER	20
Su-25/FROGFOOT	7
F-7	65

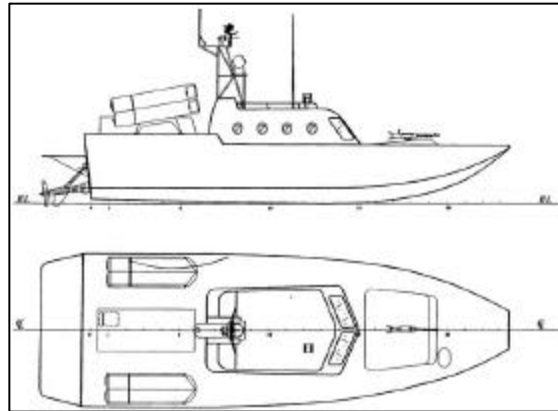


THE SHAHAB-3 IS THE CORNERSTONE OF IRAN'S STRATEGIC FORCES

Source: "Iran, Military," *Jane's Sentinel Security Assessment*, May-October 2001, (Alexandria, VA: 2001); *The Military Balance*, (London: International Institute for Strategic Studies, 2000).

Navy

Personnel	18,000
Submarines	
KILO	3
Frigate/Corvette	
Alvand	3
Bayandor	2
Fast Attack Craft-Missile	21
Combattante II	10
Osa II	1
Hudong	10
Catamarans	?
Fast Attack Craft-Gun	3
Zafar (Chaho)	3
Patrol Craft	
MIG-S-2600	5
Parvin	3
US Mk III	9
PBI	120
US Mk II	6
MIG-G-1900	8
MIG-S-1800	6
Boghammar	24
Boston Whaler	20
Ashoora	?
Yunus	?
Jet Skis	?
Motor boats	1,000+
MCM	5
LST	5
LSL	6
LCT	3
Hovercraft	6
<u>Coastal Defense Cruise Missiles</u>	
CSSC-2/SILKWORM	300
CSSC-3/SEERSUCKER	100
SS-N-22/SUNBURN	24
C-802	?



**IRAN IS EXPERIMENTING WITH SMALL, FAST
ATTACK MISSILE CATAMARANS**



**THE IRGC HAS A HISTORY OF ASYMMETRIC NAVAL
WARFARE**

Source: "Navy, Iran," *Jane's Sentinel Security Assessment - The Gulf States 09*, (Jane's: Alexandria, VA), www.janes.com, [11/16/01]; Richard Scott, "China Cat is Out of the Bag," *Jane's Defense Weekly*, (14 November 2001), www.janes.com, [11/26/01]; Stephen Saunders, "River Roadstead Patrol and Hovercraft (PBR)" *Jane's Fighting Ships*, 2001-2002, (London: Jane's Publishing Group, 2001), www.janes.com, [11/26/01]

APPENDIX D -- NORTH KOREAN ORDER OF BATTLE

Ground

Personnel:	923,000
Tanks:	2,000 T-54/55
	600 T-62
Artillery	10,700 (includes towed, SP, MRL)
Armored Personnel Carriers	2,300

Ground forces constitute North Korea's critical strength. In the event of hostilities, the DPRK Army likely will initiate mass combined arms offensives combined with the extensive use of chemical and biological weapons.

Air Defense

Personnel:	80,000
Surface-to-Air Missiles	1,100
SA-2/GUIDELINE	
SA-3/GOA	
SA-5/GAMMON	
MANPADS	15,000
SA-7/GRAIL	
SA-16/GIMLET	
Anti-aircraft artillery	10,800

Air Force

Fighter/Interceptors	840
MiG-15/FAGOT	190
MiG-17/FRESCO	120
MiG-19/FARMER	160
MiG-21/FISHBED	160
MiG-23/FLOGGER	45
Su-7/FITTER	20
Su-25/FROGFOOT	35

Navy

Personnel:	46,000
Bases:	8
Frigates	1
Corvettes	2
Missile Attack Boats	39
Coastal Patrol Craft	388
Mine Warfare Craft	23
Amphibious Craft	194
<u>Submarines</u>	<u>24</u>
WHISKEY	4
ROMEO-China	4
ROMEO-DPRK	16

The KPN has a coastal defense role as well as a well-documented special forces role.

Source: Defense Intelligence Agency, *North Korea: The Foundations for Military Strength*, (Washington, DC: 1991); Defense Intelligence Agency, *North Korea: The Foundations for Military Strength - Update 1995*, (Washington, DC: 1996)

APPENDIX E -- MAP OF PERSIAN GULF

Persian Gulf Region



604822 (546740) T=81

APPENDIX F- MAP OF KOREAN PENINSULA

Korean Peninsula



NOTES

[1] For additional information on new U.S. Navy force protection procedures and TTPs the following documents might prove useful: *DOD USS Cole Commission Report*, 9 January 2001, <<http://www.defenselink.mil/pubs/cole20010109.html>> [11/25/01], 1-9; Senate Armed Services Committee, Emerging Threats and Capabilities Subcommittee, "US Senator Pat Roberts (R-KS) holds hearing on Defense Department Science and Technology Programs," 5 June 2001, <<http://lexis-nexis.com/congcomp/document?>>, [11/21/01], 25, 38-59; US House Armed Services Committee, "Testimony February 11, 1999 Conrad C. Lautenbacher and Lowell E. Jacoby Vice Admiral and Rear Admiral U.S. Navy Military Procurement Protection Equipment and Countermeasure Devices," 11 February 1999, <<http://lexis-nexis.com/congcomp/document?>> [11/21/01], 1-3; Senate Armed Services Committee, Seapower Subcommittee, "U.S. Senator Edward Kennedy (D-MA) Holds Hearing on Seapower Operational Programs and Requirements," 7 June 2001, <<http://lexis-nexis.com/congcomp/document?>>, [11/21/01], 1-34; Bill Johnson-Miles, "Force Protection Helps Navy Become More Security Conscious," *Surface Warfare*, (September/October 2001), 10-13; "Surface Warfare's New Deputy Director Focusing on The Fleet and Force Protection," *Surface Warfare*, (September/October 2001), 22-23; Marc Boyd, "Mine Warfare Command Tests Force Protection Readiness," *Surface Warfare*, (September/October 2001), 24-27; Dick Cole, "USS Cole: Where Do We Go From Here?" *Surface Warfare*, (January/February 2001), 6-12. The U.S. Navy has been conducting some recent tests with small boats laden with chemical and biological agents: Marshall Glenn, "Asymmetric Warfare: A Growing Threat with METOC Implications," *Naval Meteorological and Oceanography Command News Online*, (January/February 2001), <http://pao.cnmoc.navy.mil/pao/n_online/archive/vol21no1/articles/assymmetr.htm>, [11/21/01]. Richard Scott offers a glimpse into how an allied navy is preparing tactical-level defenses against the FAC threat. Richard Scott, "UK Examines Counters to FIAC Threat." *Jane's Navy International*. October 2001.

[2] This is an entirely natural development given the emphasis being placed on terrorism and force protection issues in general. Furthermore, there are indications that considerable research is being done on foreign FACs at the classified level. See for example, the sanitized results of the Naval Fleet Battle Experiment Echo: Milan Vego (compiler), "Fleet Battle Experiment Echo: Asymmetric Urban Threat," *Littoral Warfare: A Book of Readings*, September 2001, NWC 2155 (Newport, RI: Naval War College, 2001) and Bryan Bender, "U.S. Navy Prepares for Asymmetric Defense," *Janes Defense Weekly*, 27 January 1999, 11. FBE-E notably included the use of small boats and jet skis as asymmetric suicide platforms. Rohan Runaratna offers a timely piece on the terrorism aspects of small boat warfare. Rohan Runaratna, "The Asymmetric Threat from Maritime Terrorism." *Jane's Navy International*. October 2001, 24-29.

[3] Donald Chisholm, *Industrial Scale Asymmetric Warfare*, (Newport, RI: Naval War College, 2001), 116.

[4] James Bruce, "Choking the Strait: Iranian Naval Firepower and the Threat to Gulf Shipping," *Jane's Intelligence Review*, (September 1996), 411-414; Dale R. Davis, "Iran's Strategic Philosophy and Growing Sea-Denial Capabilities," *Marine Corps Gazette*, (July 1995), 20-22; U.S. Defense Intelligence Agency, *North Korea: the Foundations for Military Strength*, (Washington, DC: 1991). These sources offer good overviews of the small boat and integrated coastal defenses for both countries.

[5] Benjamin S. Yates, *David vs. Goliath: Small Boat Challenges to Naval Operations in Coastal Warfare*, Masters Essay, (Quantico, VA: Marine Corps University, 1998), 36-37; Yedidia "Didi" Ya'ari, "The Littoral Arena: A Word of Caution," *Naval War College Review*, (Spring 1995), 18; Tim Sloth Joergensen, "U.S. Navy Operations in Littoral Waters 2000 and Beyond," *Naval War College Review*, (Spring 1998), 24. This experience was also driven home during U.S. Navy operations against Iranian FACs during the 1980's. See, for example, Bud Langston and Don Bringle, "Operation Praying Mantis," *United States Naval Institute Proceedings*, (Naval Review 1989), 65. Chisholm notes that air power played an important role in eliminating/degrading the Japanese suicide boat threat in World War II: Chisholm, 125, 128.

[6] "Iran, Navy, Armed Forces Structure," 1 September 2001, <Iran-Middle East/North Africa - Navy - nations/Alliances/Geographic Regions - USNI>, USNI Periscope Database, (Rockville, MD: United Communications Group, 2001); Anthony Cordesman, *Iran and Iraq: the Threat from the Northern Gulf*, (Boulder, CO: The Westview Press, 1994), 66-77. Significantly, Iran has not made any major surface combatant purchase since the 1970s.

[7] The IRGCN fought the tanker wars with Swedish-built *Boghammars* and "Boston Whalers"; however, these only carried machine guns and rockets for armament. It was only in the 1990s that more significant capabilities were added with the acquisition of the C-802-equipped *Houdongs* from China. See Nadia El-Sayed El-Shazly, *The Gulf Tanker War*, (New York: St. Martin's Press, 1998) for a good history of the tanker wars and the role of the IRGCN in prosecuting them. Shazly also notes the suicide boat threat - Shazly, 265, 269. Cordesman is strong on general naval order of battle and new FAC acquisitions - Cordesman, 71-76. USNI Periscope is equally strong in most NOB areas, especially the *Houdong* acquisition which took place between 1994 and 1996. For information on indigenous Iranian FAC production programs and the use of jet skis see "RiverRoadstead Patrol and Hovercraft (PBR)," for Patrol Forces, Iran, <www.janes.com>, posted on 23 May 2001 [11/26/01]; Richard Scott, "China Cat is Out of the Bag," *Janes's Defense Weekly*, (14 November 2001), <http://www.janes.com> [11/26/01] offers an overview of the new fast attack catamaran purchase. Steven Shaker offers one of the best articles on Iranian training with small suicide boat attacks and robot craft. Steven M. Shaker, "Suicidal Boat and Robot Craft Attacks," *United States Naval Institute Proceedings*, (August 1988), 96-97.

[8] Cordesman, 70.

[9] Keiran Phelan and Martin H. Brice, *Fast Attack Craft: The Evolution of Design and Tactics*, (London: Macdonald & Jane's, Ltd. 1977), 206. Cordesman concurs with the lower evaluation of Iranian technical skills, Cordesman, 66, 71-72. It should be noted that the Iranians have made a serious attempt at more rigorous training: see Bruce, 414.

[10] Information on the Korean People's Navy is very difficult to locate. For example, there is no mention of North Korean naval strategy or capabilities in the *Naval War College Review* for the past 20 years. This is an astounding omission given the role North Korea plays in U.S. threat perceptions and its proven military capabilities. Available information on the KPN can be found in U.S. Defense Intelligence Agency, 44-46; "Navy, North Korea," *Jane's Sentinel Security Assessment*, 26 April 2001, <<http://www.janes.com>>, [1/5/02].

[11] Joseph Bermudez, *North Korean Special Forces*, 2nd Edition, (Annapolis, MD: Naval Institute Press, 1998), 199-204. Although this paper is focused on the small boat threat to USN surface ships in general, at least one study offers tactical and operational solutions to the DPRK infiltration missions: see John Tilelli and William P. Gerhardt, "Solving Threat SOF Challenges," <<http://www-cgsc.army.mil/milrev/English/marapr98/tilelli.htm>>, [1/12/02]

[12] Ibid, 3, 216-217. Bermudez's book is filled with references to suicide missions - see Bermudez, 4, 132, 137, 138, 165, and 258.

[13] Wayne P. Hughes, "Take the Small Boat Threat Seriously," *United States Naval Institute Proceedings*, (October 2000), 23-25.

[14] El-Shazly, 114-119; David Miller, "Submarines in the Gulf," *Military Technology*, (June 1993), 42-43; Travis M. Petzoldt, "The Arabian Gulf as a Model for Littoral USW," *The Submarine Review*, (July 2001), 47-49.

[15] Milan Vego, *Naval Strategy and Operations in Narrow Seas*, (London: Frank Cass Publishers, 1999), 26.

[16] Cordesman is the source of the order of battle information for Bushehr: Cordesman, 69. Chisholm also comments that the Japanese faced similar deployment problems as they prepared small boat defenses in the Philippines and Okinawa. Chisholm, 50.

[17] U.S. Defense Intelligence Agency, 44.

[18] Peter C. Chu and Susan K. Wells, *Temporal and Spatial Scales of the Yellow Sea Thermal Variability*, <http://www.oc.nps.navy.mil/~chu/web_paper/jgr/yellow_wells/node3.html>, [1/9/02], Chapter 2: Characteristics of the Yellow Sea; Bermudez, 9, 194, 204. Data on the Yellow Sea seems to be as scarce as that for the DPRK Navy.

[19] Bermudez, 209.

[20] Chisholm, 115.

[21] Yates, 11-16, 22; Hughes, 23.

[22] Commander, Amphibious Forces, U.S. Pacific Fleet, Operation Plan No. A11-45 (Advance Draft), CAF/A16-3(1), 10 August 1945, Naval War College Microfilm. Counter- and anti-small

boat taskings were an important aspect of this OPLAN. For example, Fire Support Groups were assigned suicide boats as high priority taskings*^u. Indeed suicide boats and midget submarines were an “A” class priority for targeting, indicating the emphasis placed on them by the OLYMPIC planners. The air support plan also emphasized the need to destroy suicide-boat and midget submarine. Indeed suicide boats and midget submarines were an “A” class priority for targeting, indicating the emphasis placed on them by the OLYMPIC planners. The air support plan also emphasized the need to destroy suicide-boat and midget submarine “hideouts.” A specific anti-suicide boat plan was worked into the Air Support Plan to handle this difficult targeting problem.

[23] Dariush Zahedi and Ahmad Ghoreishi question why Iran would close the Straits. Yet, this scenario carefully calibrates Tehran’s economic interests (exporting oil through the Straits) with its political requirements (a provoked crisis with the United States in a scenario that still provides it with plausible deniability). From a military perspective, closing the Straits would enhance security by denying an opponent access to Iran’s Gulf coastline. By locking out foreign warships, Iran would also ensure its ability to dominate the inland sea of the Gulf. Dariush Zahedi and Ahmad Ghoreishi, “Iran’s Security Concerns in the Persian Gulf,” *Naval War College Review*, (Summer 1996), 85.

[24] On paper, Iran possesses an impressive air force. According to Chubin, the Iranian Air Force front-line units include MiG-29/FULCRUMs, Su-24/FENCERS, F-7s, not to mention remaining F-14s and F-4s from the days of the Shah. Yet, during Desert Storm, Iraq possessed an even greater number of platforms and fared poorly against Coalition offensive counter air missions. Twelve years later, U.S. air power is, if anything, even stronger. It is difficult to imagine how, given their weaknesses in electronic warfare, the Iranians will be able to withstand a sustained assault on their air power. Similarly, Chubin writes of Iranian air defenses as “a shambles, old, or virtually nonexistent” since they rely on old I-HAWK SAMs and the large, SA-5/GAMMON long-range SAM. This picture could (or may have changed) if Tehran has managed to acquire a more formidable air defense system such as the SA-10/GRUMBLE or the SA-12/GIANT. At the moment, such a purchase has been speculated in the press but hard facts of a delivery seem to be lacking. Given these weaknesses, coupled with the experience of US combat aviation over Iraq, the Iranian air defenses are the true critical vulnerability in its combat forces. Shahram Chubin, *Iran’s National Security Policy: Intentions, Capabilities and Impact*, (Washington, DC: The Carnegie Endowment, 1994), 40-41.

[25] Milan Vego, *Operational Warfare*, NWC 1004, (Newport, RI: Naval War College, 2000), 203.

[26] Submarines are always an uncomfortable variable in any littoral warfare scenario. Iran’s possible acquisition of wake-homing torpedoes is especially troubling. See Miller, 42 or Petzoldt, 53. A 1997 ONI document also highlights the problem of wake-homing torpedoes: Office of Naval Intelligence, *Challenges to Expeditionary Warfare*, (Suitland, MD: March 1987), 11.

[27] Douglas J. MacEachin, *The Final Months of the War with Japan: Signals Intelligence, U.S. Invasion Planning, and the A-Bomb Decision*, CSI-98-10001, (Maclean, VA: Center for the

Study of Intelligence, 1998), 17, 36-38. John Ray Skates, *The Invasion of Japan: Alternative to the Bomb*, (Columbia, SC: University of South Carolina Press, 1994), 139-140.

[28] Tiboni, Frank, "Instantaneous Attack Capability Near for U.S.," 7-13 January 2002, <<http://www.defensenews.com>>r, [1/12/02]

[29] OLYMPIC relied on operational fires to limit Japanese operational maneuverability to and within the area of operations. See Commander, Amphibious Forces, U.S. Pacific Fleet, Annex H: Air Support Plan, H-2 to H-3. Chisholm notes that many Japanese suicide boats were destroyed during the preliminary bombardment of Iwo Jima. See Chisholm, 80.

[30] Chisholm offers a detailed explanation of Fly Catcher techniques and procedures: Chisholm, 98-103, 107-111.

[31] Martin Stanton offers a recent and highly relevant discussion of unconventional threats. Martin N. Stanton, "Kamikazes, Q-Ships, and Carrier Defense," *United States Naval Institute Proceedings*, (December 2001), 54-57.

[32] Ibid, 91-95, 121-122.

[33] Yates is not so sanguine about the link between small boat operations and C3. He notes that "although small boat operations require a significant command, control, and intelligence (C2I) structure to effectively carry out an offensive, their ability to operate for long periods of time, completely cut off from their C2 structure, is significant. This is accomplished by carrying out pre-planned operations." Yates, 34. While this may be partly true, targeting is a crucial aspect of small boat ASUW. Minus comms pipes to transmit the information, any targeting data is basically useless.

[34] Chisholm, 125.

[35] Chubin offers a brief overview of Iranian WMD capabilities. Iranian strengths in chemical warfare (CW) are well known from the war with Iraq. See Chubin, 45-50.

[36] Coastal cruise missile sites manned by the IRGC represent the heart of the Iranian ICD. Starting with the CSSC-2/SILKWORM and continuing through the CSSC-3/SEERSUCKER, C-802, and possibly the SS-N-22/SUNBURN, Tehran has layered its CDCMs with ever more capable systems. Destroying these assets will be a formidable task for the JFMCC. For more information on Iranian CDCMs, see Ya'ari, 12, 15; James C. Bussert, "Modernized Iranian Navy Poses New Gulf Dilemma," *Signal*, (October 1996), 38; Davis, 21; USNI Periscope, 1-2. ONI also notes the extent of the mobile TEL problem: Office of Naval Intelligence, 13-14.

[37] Phelan, 209. OLYMPIC planners also targeted FAC bases and deployment points: see Commander, Amphibious Forces, U.S. Pacific Fleet, Annex G - Naval Gunfire Support Plan, G-6. A representative sample of the OLYMPIC taskings included: "Search out and destroy coast defense guns, rocket and torpedo projectors, PT and suicide boats and midget submarines and

their shore bases throughout designated sectors of responsibility. (This task is shared by aircraft)” (G-6).

[38] Ibid, G-13.

[39] Theophile Aube, *De La Guerre Navale: Opinion d'un Marin*, (Paris, Berger et Leault Compagnie, 1885), 61.

[40] In his study on naval tactics in littoral waters, Hughes offers a pessimistic view of the survivability of blue water warships: “I have yet to find a rationale for sending large, expensive, and highly capable warships into contested coastal waters unless they can take several hits and continue fighting without missing a beat after suffering a first attack by an enemy. It is better to fight fire with fire using expendable, missile-carrying aircraft or small surface craft. In fact, ever since the introduction of numerous torpedo boats, coastal submarines, and minefields early in this century, contested coastal waters have been taboo for capital ships and the nearly exclusive province of flotillas of small, swift, lethal fast-attack craft.” Wayne Hughes, *Fleet Tactics and Coastal Combat*, (Annapolis, MD: Naval Institute Press, 2000), 290. W.J. Holland generally concurs with Hughes’ assessment but advocates the fleet submarine as a suitable platform for littoral warfare. See W.J. Holland, “A Fleet to Fight in the Littorals,” *The Submarine Review*, (April 2001), 33-38. Adams is equally pessimistic: David Adams, “We Are Not Invincible,” *United States Naval Institute Proceedings*, (May 1997), 36-39. Foreign observers are particularly doubtful about US capabilities in littoral warfare. See Joergensen, 20-29 and Yedidia Ya’ari, 7-8.

BIBLIOGRAPHY

Adams, David. "We are not Invincible." *United States Naval Institute Proceedings*. May 1997: 35-39.

Aube, Theophile. *De La Guerre Navale: Opinion d'un Marin*. Paris: Berger-Levrault et Compagnie, 1885.

Bender, Bryan. "U.S. Navy Prepares for Asymmetric Defence." *Jane's Defense Weekly*. 27 January 1999: 11.

Bermudez, Joseph. *North Korean Special Forces*. 2nd Edition. Annapolis, MD: Naval Institute Press, 1998.

Boyd, Marc. "Force Protection Readiness." *Surface Warfare*. September/October 2001: 24-27.

Bruce, James. "Choking the Strait: Iranian Naval Firepower and the Threat to Gulf Shipping." *Jane's Intelligence Review*. September 1996: 411-414.

Bussert, James C. "Modernized Iranian Navy Poses New Gulf Dilemma." *Signal*. October 1996: 37-39.

Chisholm, Donald. *Industrial Scale Asymmetric Warfare: Japanese Surface Special Attack Weapons Against U.S. Forces in World War II and the American Response*. Newport, RI: Naval War College, 2001.

Chu, Peter and Susan K. Wells. *Temporal and Spatial Scales of the Yellow Sea Thermal Variability*. www.oc.nps.navy.mil/~chu/web_paper/jgr/yellow_wells/node3.html. [1/9/02]

Chubin, Shahram. *Iran's National Security Policy: Intentions, Capabilities and Impact*. Washington, DC: The Carnegie Endowment, 1994.

Cole, Dick. "USS Cole: Where Do We Go From Here?" *Surface Warfare*. January/February 2001: 6-12.

Commander, Amphibious Forces, U.S. Pacific Fleet. Operation Plan No. A11-45 (Advance Draft). CAF/A16-3(1). 10 August 1945. Naval War College Microfilm.

Cordesman, Anthony. *Iran and Iraq: the Threat from the Northern Gulf*. Boulder, CO: The Westview Press, 1994.

Davis, Dale R. "Iran's Strategic Philosophy and Growing Sea-Denial Capabilities." *Marine Corps Gazette*. July 1995: 20-22.

Defense Intelligence Agency. *North Korea: The Foundations for Military Strength*. Washington, DC: 1991.

-----, *North Korea: The Foundations for Military Strength - Update 1995*. Washington, DC: 1996. PC-1510-101-96.

Department of the Navy. *Naval Amphibious Warfare Plan: Decisive Power from the Sea*. Washington, DC: 1999.

-----, *Naval Operational Planning*. NWP 5-01 (Rev. A). Norfolk, VA: May 1998.

“DoD USS Cole Commission Report.” 9 January 2001. <www.defenselink.mil/pubs/cole20010109.html> [11/25/01]

El-Shazly, Nadia El-Sayed. *The Gulf Tanker War*. New York: St. Martin’s Press, 1998.

Formal Investigation into the Circumstances Surrounding the Downing of Iran Air Flight 655 on 3 July 1988. Washington, DC: GPO AD-A203577.

Glenn, Marshall. “Asymmetric Warfare: A Growing Threat with METOC Implications.” *Naval Meteorological and Oceanography Command News Online*. January/February 2001.

<http://www.pao.cnmc.navy.mil/pao/n_online/archive/vol21no1/articles/asymmetr.html> [11/01]

Gunaratna, Rohan. “The Asymmetric Threat from Maritime Terrorism.” *Jane’s Navy International*. October 2001: 24-29.

“Hearing of the Special Oversight Panel on Terrorism of the House Armed Services Committee.” 13 June 2001. *Congressional Universe*. Lexis-Nexis. Dayton, OH: Lexis-Nexis. (11/21/01)

Holland, W.J. “A Fleet to Fight in the Littorals.” *The Submarine Review*. April 2001: 33-44.

Hughes, Wayne P. *Fleet Tactics and Coastal Combat*. 2nd Edition. Annapolis, MD: Naval Institute Press, 2000.

-----, “Take the Small Boat Threat Seriously.” *United States Naval Institute Proceedings*. October 2000.

“Iran, Navy.” 1 September 2001. <Nations/Alliances/Geographic Regions/Middle East/North Africa - Iran> U.S. Naval Institute Periscope Database. Rockville, MD: United Communications Group, September 2001.

Jane’s Information Group. “Navy, North Korea.” 26 April 2001. *Jane’s Sentinel Security Assessment*. <<http://www.janes.com>>. [1/5/02]

-----, “River Roadstead Patrol and Hovercraft (PBR).” *Jane’s Fighting Ships*. 23 May 2001. <<http://www.janes.com>>. [11/26/01]

-----, “Boghammar Craft (PBI).” *Jane’s Fighting Ships*. 23 May 2001. <<http://www.janes.com>> [11/16/01]

-----. "Navy, Iran." 21 August 2001. *Jane's Sentinel Security Assessment*.
<<http://www.janes.com>>. [11/16/01]

Joergensen, Tim Sloth. "U.S. Navy Operations in Littoral Waters." *Naval War College Review*. Spring 1998: 20-29.

Johnson-Miles, Bill. "Force Protection Helps Navy Become More Security Conscious." *Surface Warfare*. September/October 2001: 10-13.

Langston, Bud and Don Bringle. "Operation Praying Mantis." *United States Naval Institute Proceedings*. Naval Review 1989: 54-65.

MacEachin, Douglas J. *The Final Months of the War With Japan: Signals Intelligence, U.S. Invasion Planning, and the A-Bomb Decision*. Maclean, VA: Center for the Study of Intelligence, 1998. CSI-98-10001.

Miller, David. "Submarines in the Gulf." *Military Technology*. June 1993: 42-45.

Momen, Moojan. *An Introduction to Shi'i Islam*. New Haven: Yale University Press, 1985.

Office of Naval Intelligence. *Challenges to Naval Expeditionary Warfare*. Suitland, MD: March 1987.

Petzoldt, Travis M. "The Arabian Gulf as a Model for Littoral USW." *The Submarine Review*. July 2001: 47-63.

Phelan, Keiren and Martin H. Brice. *Fast Attack Craft: The Evolution of Design and Tactics*. London: Macdonald & Jane's, Ltd., 1977.

"Prepared Testimony of W. Seth Carus, Research Analyst, Center for Naval Analyses Before the House Committee on International Relations." 12 September 1996. *Congressional Universe*. Lexis-Nexis. Dayton, OH: Lexis-Nexis. (11/21/01)

Scott, Richard. "UK Examines Counters to FIAC Threat." *Jane's Navy International*. October 2001: 4.

-----. "China Cat is out of the Bag." *Jane's Defense Weekly*. 14 November 2001.

Shaker, Steven M. "Suicidal Boat and Robot Craft Attacks." *United States Naval Institute Proceedings*. August 1988: 96-97.

Skates, John Ray. *The Invasion of Japan: Alternative to the Bomb*. Columbia, SC: University of South Carolina Press, 1994.

Stanton, Martin N. "Kamikazes, Q-Ships and Carrier Defense." *United States Naval Institute Proceedings*. December 2001: 54-57.

“Surface Warfare’s New Deputy Director Focusing on the Fleet and Force Protection.” *Surface Warfare*. September/October 2001: 22-23.

“Testimony: Conrad C. Lautenbacher and Lowell E. Jacoby Vice Admiral and Rear Admiral U.S. Navy House Armed Services Military Procurement Protection Equipment and Countermeasure Devices.” Capitol Hill Hearing Testimony. 11 February 1999. *Congressional Universe*. Lexis-Nexis. Dayton, OH: Lexis-Nexis. (11/21/01)

Tiboni, Frank. “Instantaneous Attack Capability Near for U.S.” 7-13 January 2002, <<http://www.defensenews.com>>, [1/12/02]

Tilelli, John H. And William P. Gerhardt. “Solving Threat SOF Challenges.” <<http://www-cgsc.army.mil/milrev/English/marapr98/tilelli.htm>>.

“U.S. Senator Edward Kennedy (D-MA) Holds Hearing on Seapower Operational Programs and Requirements.” 7 June 2001. *Congressional Universe*. Lexis-Nexis. Dayton, OH: Lexis-Nexis. (11/21/01)

“U.S. Senator Pat Roberts (R-KS) Holds Hearing on Defense Department Science and Technology Programs.” 5 June 2001. *Congressional Universe*. Lexis-Nexis. Dayton, OH: Lexis-Nexis. (11/21/01)

Vego, Milan. *Naval Strategy and Operations in Narrow Seas*. London: Frank Cass Publishers, 1999.

-----, *Operational Warfare*. NWC 1004. Newport, RI: Naval War College, 2000.

-----, “Fleet Battle Experiment Echo: Asymmetric Urban Threat.” *Littoral Warfare: A Book of Readings*. (Compiler)

Ya’ari, Yedidia. “The Littoral Arena: A Word of Caution.” *Naval War College Review*. Spring 1995: 7-21.

Yates, Benjamin S. *David Vs. Goliath: Small Boat Challenges to Naval Operations in Coastal Warfare*. Master’s Essay. Quantico, VA: Marine Corps University, 1998.

Zahedi, Dariush and Ahmad Ghoreishi. “Iran’s Security Concerns in the Persian Gulf.” *Naval War College Review*. Summer 1996: 73-95.